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DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Government-Owned Inventions; Availability for Licensing

AGENCY: National Institutes of Health, HHS

ACTION: Notice

SUMMARY: The inventions listed below are owned by an agency of the U.S.

Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally-funded research and development. Foreign patent applications are filed on selected inventions to extend market coverage for companies and may also be available for licensing.

FOR FURTHER INFORMATION: Licensing information and copies of the U.S. patent applications listed below may be obtained by writing to the indicated licensing contact at the Office of Technology Transfer, National Institutes of Health, 6011 Executive Boulevard, Suite 325, Rockville, Maryland 20852-3804; telephone: 301-496-7057; fax: 301-402-0220. A signed Confidential Disclosure Agreement will be required to receive copies of the patent applications.

Induced Pluripotent Stem Cells Generated Using Lentivirus-based Reprogramming

Description of Technology: Five human induced pluripotent stem cells (iPSC) lines are generated using lentivirus-based reprogramming technology. These lines are pluripotent, meaning they have the potential to differentiate into all cells in the body, and theoretically can proliferate/self-renew indefinitely. The iPSC lines are: NC1 (derived from female's fibroblasts), NC2 (derived from female's fibroblasts), NC3 (derived from male's HUVECS), NC4 (derived from male's fibroblasts) and NC5 (derived from female's fibroblasts). Further details of these cells are available upon request. NC1 uses a retrovirus delivery system incorporating the following vectors: pMIG-hKLF4, pMIG-hOCT4, pMIG-hSOX2, and MSCV h c-MYC IRES GFP. NC2-NC5 use the hSTEMCCA-loxP lentivirus delivery system (a gift from Dr. Gustavo Mostoslavsky). These cell lines will be useful for studies related to stem cell biology, understanding diseases, potential cell therapies, and small molecule screening.

Potential Commercial Applications: The iPSCs of this technology are useful:

- a) to study the biology of stem cell development,
- b) as controls in studies to screen for small molecules to change cell fate and/or to alleviate the phenotypes of various diseases, and
- c) to test different characterization and differentiation assays.

Competitive Advantages:

- These cells can serve as control cells and, thus, significantly reduce the cost of initiating many research projects.
- These cells can be a good source of control cells.

Development Stage:

- Prototype
- Pilot
- Early-stage
- In vitro data available

Inventors: Drs. Guibin Chen and Manfred Boehm (NHLBI)

Intellectual Property: HHS Reference No. E-274-2012/0 – Research Tools.

Patent protection is not being pursued for this technology.

Licensing Contact: Suryanarayana (Sury) Vepa, Ph.D., J.D.; 301-435-5020;
vepas@mail.nih.gov

Collaborative Research Opportunity: The National Heart, Lung, and Blood Institute is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize Induced Pluripotent Stem Cells. For collaboration opportunities, please contact Denise Crooks, OTTAD, at 301-435-0103.

Stapled Peptides for Treatment of Cardiovascular Diseases and Inflammation

Description of Technology: The invention is directed to small molecule mimetics of apolipoproteins that have an inter-helical hydrocarbon bond, which stabilizes helix formation.

Apolipoproteins facilitate the transport of lipids and cholesterol in the body. Mimetics of apolipoproteins have been used to treat cholesterol-related disorders. However, these mimetics are susceptible to degradation in biological fluids and as a result, their ability to bind cholesterol becomes diminished over time.

Scientists at NHLBI have devised methods to stabilize and improve the performance of apolipoprotein mimetic peptides, using a modified hydrocarbon chain (“stapled apolipoproteins”). These stapled apolipoproteins are superior to singular apolipoproteins in that they are more resistant to enzymatic degradation and efflux a greater amount of cellular cholesterol.

Stapled apolipoproteins can be used in the treatment of cardiovascular diseases, particularly for treatment of atherosclerosis.

Potential Commercial Applications:

- Treatment of inflammation and cardiovascular diseases, including hyperlipidemia, atherosclerosis, restenosis, and acute coronary syndrome.
- Inclusion in oral, intravenous or transdermal peptide formulations.

Competitive Advantages:

- Stapled apolipoproteins are more resistant to proteolysis and display enhanced bioavailability.
- Stapled apolipoproteins are amenable to oral delivery and have increased permeability to the blood brain barrier.

Development Stage:

- Pre-clinical
- In vitro data available
- In vivo data available (animal)

Inventors: Alan T. Remaley (CC), Marcelo A. Amar (NHLBI), Imoh Z. Ikpot (NHLBI), Denis O. Sviridov (NHLBI), David O. Osei-Hwedieh (NHLBI), Scott Turner (KineMed)

Publication: Osei-Hwedieh DO, et al. Apolipoprotein mimetic peptides: Mechanisms of action as anti-atherogenic agents. *Pharmacol Ther.* 2011 Apr;130(1):83-91. [PMID 21172387]

Intellectual Property: HHS Reference No. E-126-2011/0 – US Application No. 61/480,986 filed 29 April 2011; PCT Application No. PCT/US1235870 filed 30 April 2012

Licensing Contact: Lauren Nguyen-Antczak, Ph.D., J.D.; 301-435-4074;
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Collaborative Research Opportunity: The NHLBI Lipoprotein Metabolism Section is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize Hydrocarbon-stapled Apolipoprotein Peptide Mimetics for the Treatment of Cardiovascular Diseases and Inflammation. For collaboration opportunities, please contact Denise Crooks, Ph.D. at crooksd@nhlbi.nih.gov.

Parvovirus B19 Vaccine

Description of Technology: Parvovirus B19 (B19V) infection causes fifth disease, a disease characterized by rashes to the face and other parts of the body that primarily affects children. However, adults can also develop fifth disease and it can lead to more severe conditions. Patients that are immunocompromised, such as those who are HIV infected, organ transplant recipients, and cancer patients, can be particularly susceptible to more severe outcomes from B19V infection. Infection can also cause anemia and in pregnant women, it can lead to hydrops fetalis.

The subject technologies are expression vectors for the production of B19V VP1 and VP2 capsid proteins. Co-expression of the two proteins produce empty virus-like particles (VLPs) that can be used to develop a vaccine against parvovirus B19 and a packaging system for infectious B19V virus. Different expression vectors have been developed and optimized for expression in insects cells and more recently in mammalian cell lines such as 293, Cos7, HeLa cells and 293T cells.

Potential Commercial Applications: Vaccine against parvovirus B19V.

Competitive Advantages: There is currently no B19V vaccine on the market.

Development Stage:

- Early-stage
- Pre-clinical
- Clinical
- In vitro data available
- In vivo data available (animal)
- In vivo data available (human)

Inventors: Neal S. Young, Takashi Shimada, Sachiko Kajigaya, Ning Zhi (NHLBI)

Publications:

1. Bernstein DI, et al. Safety and immunogenicity of a candidate parvovirus B19 vaccine. *Vaccine*. 2011 Oct 6;29(43):7357-63. [PMID 21807052]

2. Zhi N, et al. Codon optimization of human parvovirus B19 capsid genes greatly increases their expression in nonpermissive cells. *J Virol*. 2010 Dec;84(24):13059-62. [PMID 20943969]

Intellectual Property:

- HHS Reference No. E-286-1988/2 – U.S. Patent No. 5,916,563 issued 29 Jun 1999

- HHS Reference No. E-286-1988/1 – U.S. Patent No. 6,001,371 issued 14 Dec 1999; U.S. Patent No. 6,132,732 issued 17 Oct 2000

- HHS Reference No. E-266-2000/0 – U.S. Patent No. 6,558,676 issued 06 May 2003

- HHS Reference No. E-011-2010/0 – International PCT Appl. No. PCT/US2011/024199 with national stage filings in the U.S. and Europe

Licensing Contact: Kevin W. Chang, Ph.D.; 301-435-5018;

changke@mail.nih.gov

Collaborative Research Opportunity: The National Heart, Lung, and Blood Institute is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize the technology for producing Parvovirus B19 vaccine. For collaboration opportunities, please contact Cecilia Pazman, Ph.D. at pazmance@mail.nih.gov.

May 2, 2013
Date

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